U. S. FOREST SERVICE

RESEARCH NOTE NC-13

NORTH CENTRAL FOREST EXPERIMENT STATION, FOREST SERVICE—U.S. DEPARTMENT OF AGRICULTURE

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Cordwood Yields From Thinnings in Young Oak Stands in the Missouri Ozarks

Proposed construction in Missouri of pulpmills using oak cordwood should result in a greater demand for pole-size oak trees, thus making needed thinnings feasible in young oak stands. According to the 1958 forest survey, poletimber stands (which are mainly oak) occupy 39 percent of the commercial forest area of the eastern Ozarks, more than any other size class.[1] More intensive management of the large areas of oak-hickory poletimber stands will be possible as markets improve. Recent experimental thinnings in young, even-aged oak stands cut to several stocking levels provide data on possible cordwood yields.

During 1962 and 1963, a level-of-stocking study was established in fully stocked 20- and 40-year-old oak stands in the Missouri Ozarks. Most of the trees are black oak (*Quercus velutina Lam.*); other species include white oak (*Q. alba* L.), scarlet oak (*Q. coccinea* Muenchh.), red oak (*Q. rubra* L.), post oak (*Q. stellata* Wangenh.), and hickories (*Carya* spp.). These even-aged, oak-hickory stands are growing on soils classified as Clarksville cherty loam or silt loam. Site indices range from 50 to 80 feet.

There are 60 half-acre plots, 30 in each age class. Basal area of the plots before thinning ranged from about 60 square feet per acre in the younger stands to 110 square feet in the older stands.

The density measure used in this study is stocking percent based on the tree-area ratio.[2] Plots were thinned to four stocking levels — 30, 50, 70, and 90 percent. The original stand, yield, and residual stand were measured (Table 1).

Because only small trees were cut in the 20-year-old stands, the volume yields were low. Such early thinnings probably will not pay an immediate net return and may be justified only on the better sites where production of high-quality trees is a reasonable objective.

In the 40-year-old stands, however, larger trees are available and higher yields per acre are possible. Thinning to about 70 square feet of basal area produced 4.2 cords per acre, and thinning to 50 square feet yielded nearly 10 cords per acre.

Experience indicates that desirable stocking for 40-year-old oak stands is about 60 square feet after thinning. Such a thinning in fully stocked stands would yield about 7 cords per acre and leave the stands in better condition to produce more high-quality wood. The development of a pulpwood market should make such thinnings more attractive to timberland managers.

These data should be useful for estimating cordwood yields from initial thinnings in well-stocked oak-hickory stands. Additional growth and yield data for the several thinning schedules in this study will be available in the future.

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[1] *Mendel, Joseph J. Timber resources of the eastern Ozarks. U.S. Forest Serv. and Univ. Missouri Agr. Exp. Sta. Bull. B779. 1961.*

[2] *Chisman, H. H. and Schumacher, F. X. On the tree-area ratio and certain of its applications. J. Forest. 38: 311-317. 1940.*

TABLE 1. — *Original volumes, yields and volumes left after thinning fully stocked 20- and 40-year-old oak-hickory stands to several density levels*

Density level after thinning		Original stand		Thinning yield		Residual stand	
Stocking percent	Basal area sq. ft.	Cubic feet[1/]	Cords[2/]	Cubic feet[1/]	Cords[2/]	Cubic feet[1/]	Cords[2/]
			Age 20				
30	24	290	4.4	133	2.0	157	2.4
50	39	267	4.1	43	0.7	224	3.4
70	52	388	6.0	47	0.7	341	5.3
90	66	265	4.0	9	0.1	256	3.9
			Age 40				
30	30	1,536	23.6	943	14.5	593	9.1
50	50	1,617	24.9	640	9.8	977	15.1
70	70	1,605	24.7	276	4.2	1,329	20.5
90	88	1,745	26.9	111	1.7	1,634	25.2

1/ Gross peeled cubic-foot volume in trees 4.6 inches d.b.h. and larger to a 3-inch top d.i.b.

2/ Rough cords computed at 65 cubic feet per cord.

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